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Barriers and outcomes associated with unfulfilled requests for permanent contraception following vaginal delivery☆,☆☆,★

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ABSTRACT

Objectives: To identify barriers to postpartum permanent contraception procedures after vaginal delivery and to explore contraceptive and reproductive outcomes of women who experience unfulfilled requests.
Study design: We performed a retrospective cohort study of women requesting postpartum permanent contraception after vaginal delivery from 7/1/11 to 6/30/14 at Strong Memorial Hospital in Rochester, NY. We ascertained patient characteristics and outcomes through electronic medical records and birth certificate data search.
Results: Of 189 women in our sample, 78 (41.3%) had a postpartum permanent contraception procedure. Factors associated with unfulfilled requests in adjusted analysis included BMI ≥40 (OR 3.71, 95% CI 1.46–9.48 compared to BMI <35), federal sterilization consent signed ≥36 weeks (OR 5.10, 95% CI 1.64–15.86 compared to <36 weeks) and delivery in the latter half of the week (Wednesday–Saturday) (OR 2.02, 95% CI 1.08–3.79). Documented reasons for unfulfilled permanent contraception requests included patient changing her mind related to procedural issues (21, 18.9%), invalid consent (20, 18.0%), maternal obesity (17, 15.3%), lack of operating room availability (14, 12.6%) and ambivalence about permanent contraception (5, 4.5%). Of 57 women who planned for interval permanent contraception and had institutional follow-up over the subsequent year, 14 (24.6%) had a procedure, 8 (14.0%) initiated long-acting reversible contraception, and 13 (22.8%) became pregnant.
Conclusions: Fewer than half of women obtained desired postpartum permanent contraception after vaginal delivery, with logistical issues and obesity being the most common reported barriers. Health care providers should advocate for access to postpartum permanent contraception, as well as discuss prenatally the individualized probability of nonfulfillment and importance of alternative contraceptive plans.
Implications: Logistical barriers and inappropriate antenatal preparation contribute to the fact that over half of women do not obtain desired postpartum permanent contraception after vaginal delivery. To respect reproductive autonomy and improve care, clinicians and other health officials should eliminate barriers to immediate postpartum permanent contraception while increasing access to alternative options.

1. Introduction

Unplanned pregnancies, with increased health care costs and poorer associated maternal and fetal outcomes [1–5], account for nearly half of all pregnancies in the United States [6]. The postpartum period is a critical time for initiation of contraception to prevent unplanned short-interval pregnancy; however, attendance at scheduled postpartum visits is low [7], and many women prefer to obtain contraception during their delivery hospitalization [8]. Approximately half of US women intending to undergo immediate postpartum permanent contraception procedures do not receive them, leaving 350,000 women each year unable to achieve their contraceptive plan [9–11]. Women denied postpartum permanent contraception experience higher pregnancy rates in the subsequent year compared to postpartum women who did not seek permanent contraception (46.7% vs 22.3%, p<.001) [12]. Accordingly, the American College of Obstetricians and Gynecologists has recommended improving access to this time-sensitive procedure [10].

Known barriers to obtaining inpatient postpartum permanent contraception include lack of valid federal consent, lack of operating room availability, patient misgivings, and maternal and neonatal medical conditions [13–16]. Previous research has often grouped women with different routes of delivery, despite different barriers faced, and has not quantitatively described reasons for women reported to have changed

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their minds [13,15–17]. Additionally, obstacles like inadequate prenatal care or operating room policies may be different across institutions. Finally, little is known about immediate and long-term contraceptive use by women with unfulfilled postpartum permanent contraception requests, though previous studies have shown that women continue to face barriers to accessing permanent and long-acting reversible contraception after hospital discharge [18]. We aimed to describe postpartum permanent contraception fulfillment rates, define the type and prevalence of barriers to execution, identify substitute contraceptive plans, and determine subsequent reproductive and contraceptive outcomes for women admitted to the hospital with a plan for postpartum permanent contraception after vaginal delivery using a retrospective cohort from the University of Rochester Strong Memorial Hospital.

2. Materials and methods

We sampled patients delivering at the University of Rochester Medical Center (URMC), Strong Memorial Hospital (SMH) between July 1, 2011, and June 30, 2014, who planned a vaginal delivery with a postpartum permanent contraception procedure during that hospitalization. SMH is a tertiary referral center that performed 8599 deliveries during the study period, including 5661 vaginal and 2938 Cesarean deliveries. During the study period, physicians performed postpartum permanent contraception procedures primarily via minilaparotomy partial salpingectomy on postpartum day 1, after the completion of all scheduled cases. Typical practice during antepartum care was to encourage all interested patients to sign federal sterilization consent, regardless of whether these documents would satisfy the federally mandated waiting period for publicly insured women, in case of both preterm delivery or unscheduled Cesarean section, as well as to minimize future barriers to permanent contraception. When patients are discharged, medical records staff then scans these documents into each patient's medical record and titles them accordingly. Standardized templates for prenatal progress notes, the admission history and physical, and daily postpartum progress notes all prompt documentation of postpartum contraceptive plans.

We queried the electronic medical record system for all patient records with a delivery during the study period and scanned documents with the words "sterilization," "tubal" or "BTL" in the file name. A single investigator (R.F.B.) searched through each record for details related to inclusion in the study sample, excluding records that were incomplete or duplicates, were from other URMC hospitals, pertained to interval permanent contraceptive procedures or those completed during planned cesarean section, related to tubal procedures other than for permanent contraception, or were for patients who had contraindications to vaginal delivery or requested permanent contraception only in the event of unplanned cesarean delivery but not following vaginal delivery. We excluded patients if they experienced intrauterine fetal demise or peripartum hysterectomy. Of the remaining study sample, the investigator assessed fulfillment of the requested postpartum permanent contraception procedure and, when the requested procedure was not performed, documented reasons for nonfulfillment, any documentation of short- and long-term alternate contraceptive plans, and subsequent medical encounters within the URMC system to ascertain reproductive and contraceptive outcomes over the subsequent 12 months. We determined outcomes by examining documentation of permanent contraceptive procedure, receipt of long-acting reversible contraception, documentation of a pregnancy, evidence of continued reproductive health care without altered contraceptive plan, or documentation of continued short-acting contraceptive use greater than a year after delivery, with patients lacking all of those considered to have not followed up in the University of Rochester system.

We captured demographic and pregnancy information from the Finger Lakes Perinatal Database, which includes additional patient-provided information from the New York State birth certificate form as well as hospital-provided information characterizing pregnancy complications and maternal and neonatal outcomes. Collected demographic variables included age, race, ethnicity, marital status, educational level and insurance provider. Collected maternal information included gravidity, parity, delivery body mass index (BMI), obstetric provider assessment of high-risk status, illegal substance use, pregnancy intention and adequacy of prenatal care (defined by the Kotelchuck index, a common tool incorporating gestational age at initiation of prenatal care and total number of visits as a proportion of those recommended by ACOG [19,20]). Neonatal variables included congenital malformations, health problems and need for care in the neonatal intensive care unit.

We analyzed data using Stata SE release version 15.1, using Pearson χ^2 testing for bivariate categorical analyses. We performed logistic regression to examine relevant individual associations with unfulfilled postpartum permanent contraception requests and then incorporated those variables into an adjusted multivariable model using forward stepwise selection. We considered variables for the multivariable model if bivariate $p<.20$; we decided a priori to include age, insurance type and parity, regardless of p value, based on significant associations in prior studies [15,17]. We considered a $p<.05$ as significant. The University of Rochester Institutional Review Board approved this study.

3. Results

Of 1938 identified charts, including 1313 unique records, we excluded 1089 patients whose documents did not pertain to a desired postpartum permanent contraceptive procedure after vaginal delivery at SMH. From the remaining 224 patients who met inclusion criteria on hospital admission, we excluded 35 (15.6%) from our final sample due to unscheduled cesarean section, 30 (85.7%) of whom underwent concurrent tubal ligation. Of the remaining 189 women who delivered vaginally and requested postpartum permanent contraception, 78 (41.3%) had a procedure prior to hospital discharge. Demographic and medical characteristics of the 189 subjects delivering vaginally are shown in Table 1. Maternal BMI, timing of federal sterilization consent and delivery day of the week were all significantly associated with unfulfilled requests in both unadjusted and adjusted analysis (Table 2).

Among women with unfulfilled postpartum requests for permanent contraception, primary documented reasons are listed in Table 3. Lack of valid federal consent was the most frequent documented barrier, followed by maternal medical contraindications, most commonly obesity. No postpartum permanent contraception procedures were performed in patients with BMI ≥45 at delivery. In total, 12.6% of unfulfilled requests were due to explicit lack of operating room availability, which was significantly more likely when delivery occurred in the latter part of the week (Wednesday–Sunday) compared to the beginning (OR 10.6, 95% CI: 1.2–97.6). Refusal to remain fasting was the most common reported patient-driven reason for cancellation, followed by concerns about the surgical procedure itself, with 4/10 patients specifically citing that they did not want additional intravenous lines or anesthesia.

Alternative contraceptive plans and subsequent contraceptive and reproductive events are presented in Table 4. Most women who were denied postpartum permanent contraception planned for an interval procedure (73, 65.8%), with a significant minority choosing long-acting reversible contraception (LARC) (18, 16.2%) or being undecided between the two options (8, 7.2%). For "bridge" contraception prior to eventual long-acting or permanent contraception, patients most commonly chose depot medroxyprogesterone acetate (DMPA) (48, 49.5%), which they received prior to hospital discharge. We had 1-year follow-up data on 82/111 (73.9%) women with unfulfilled postpartum permanent contraception requests. Fifty-seven women (69.5% of followed sample) explicitly intended interval permanent contraception, of whom 14 (24.6%) had a procedure, 8 (14.0%) initiated LARC and 13 (22.8%) became pregnant during the next year. Women who did not receive subsequent care in our system were less likely to select any bridge method (41.7% vs 72.6%, $p=.01$), and within our followed sample, use of

Table 1
Characteristics of women requesting postpartum permanent contraception after vaginal delivery

	Total (%)	Permanent contraception completed (%)	Permanent contraception not completed (%)	p value[a]
Total	189 (100.0%)	78 (41.3%)	111 (58.7%)	
Age				.28
≤25	39 (20.6%)	15 (19.2%)	24 (21.6%)	
26–30	64 (33.9%)	26 (33.3%)	38 (34.2%)	
31–35	48 (25.4%)	24 (30.8%)	24 (21.6%)	
36–40	27 (14.3%)	7 (9.0%)	20 (18.0%)	
>40	11 (5.8%)	6 (7.7%)	5 (4.5%)	
Race/ethnicity				.34
White non-Hispanic	58 (30.7%)	24 (30.8%)	34 (30.6%)	
Black non-Hispanic	88 (46.6%)	36 (46.2%)	52 (46.9%)	
Hispanic	35 (18.5%)	13 (16.7%)	22 (19.8%)	
Asian	3 (1.6%)	3 (3.9%)	0 (0%)	
Other	5 (2.6%)	2 (2.6%)	3 (2.7%)	
Marital status				.67
Married	40 (21.2%)	19 (24.4%)	21 (18.9%)	
Partner involved	86 (45.5%)	34 (43.6%)	52 (46.9%)	
No partner	63 (33.3%)	25 (32.1%)	38 (34.2%)	
Education level				.12
High school or less	116 (61.4%)	53 (68.0%)	63 (56.8%)	
Any college	73 (38.6%)	25 (32.1%)	48 (43.2%)	
Primary insurance				.40
Private	16 (8.5%)	5 (6.4%)	11 (9.9%)	
Public	173 (91.5%)	73 (93.6%)	100 (90.1%)	
Parity				.09
1	3 (1.6%)	0 (0%)	3 (2.7%)	
2	25 (13.2%)	14 (18.0%)	11 (9.9%)	
3	69 (36.5%)	23 (29.5%)	46 (41.4%)	
≥4	92 (46.7%)	41 (52.6%)	51 (46.0%)	
BMI				<.01
<30	64 (33.9%)	34 (43.6%)	30 (27.0%)	
30–34.9	50 (26.5%)	24 (30.8%)	26 (23.4%)	
35–39.9	42 (22.2%)	13 (16.7%)	29 (26.1%)	
40–44.9	24 (12.7%)	7 (9.0%)	17 (15.3%)	
≥45	9 (4.8%)	0 (0%)	9 (8.1%)	
Labor epidural	115 (60.9%)	48 (61.5%)	67 (60.4%)	.87
High-risk pregnancy	37 (19.6%)	13 (16.7%)	24 (21.6%)	.40
Maternal drug use	38 (20.1%)	17 (21.8%)	21 (18.9%)	.63
Adequate prenatal care[b]	72 (59.5%)	32 (58.2%)	40 (60.6%)	.79
Exclusive breastfeeding	27 (14.8%)	8 (10.7%)	19 (17.8%)	.19
Neonatal complications	43 (22.8%)	16 (20.5%)	27 (24.3%)	.54
Delivery gestational age				.25
<34 weeks	10 (5.3%)	2 (2.6%)	8 (7.2%)	
34–36 weeks	15 (7.9%)	8 (10.3%)	7 (6.3%)	
≥37 weeks	164 (86.8%)	68 (87.2%)	96 (86.5%)	
Delivery day of week				.02
Sunday–Tuesday	80 (42.3%)	41 (52.6%)	39 (35.1%)	
Wednesday–Saturday	109 (57.7%)	37 (47.4%)	72 (64.9%)	
Gestational age at federal consent				<.01
<32 weeks	113 (59.8%)	54 (69.2%)	59 (53.2%)	
32–35 weeks	48 (25.4%)	20 (25.6%)	28 (25.2%)	
≥36 weeks	28 (14.8%)	4 (5.1%)	24 (21.6%)	

[a] p value for patients receiving versus not receiving immediate postpartum permanent contraception.
[b] Defined by the Kotelchuck index, incorporating timing of onset and number of visits during prenatal care [19,20].

any bridge method was associated with lower rates of pregnancy in the subsequent year (17.0% vs 40.0%, p=.04). There was no significant association between use of a bridge method and interval initiation of permanent or long-acting reversible contraception.

4. Discussion

Fewer than half of women requesting immediate postpartum permanent contraception after vaginal delivery in our institution successfully underwent the requested procedure. Fulfillment was unaffected by patient age, race, marital status, education, insurance type, high risk status, adequacy of prenatal care, or parity, in contrast to prior studies [15,17,21,22]. In addition to supporting previous research showing lack of valid federal sterilization consent and high maternal BMI to be barriers [16,21–24], we discovered novel obstacles related to surgical scheduling policies, with delivery later in the week significantly decreasing fulfillment of permanent contraception requests. While the majority of women with unfulfilled requests intended to obtain interval permanent contraception, few did, and many became pregnant in the subsequent year, though pregnancy rates were lower when a bridge contraceptive method was used.

Institutional policies created greater obstacles to postpartum permanent contraception completion in our sample than suggested by previous studies [14,16]. In addition to explicit lack of operating room availability, half of patients who "changed their minds" did so because of unpredictable scheduling, the need for fasting or concerns about additional anesthesia, leaving 29 (26.1%) cancellations directly related to the surgical scheduling policies at our institution. Postpartum permanent contraception procedures at our institution generally occur 1–2 days postpartum, after the completion of scheduled cases, and rely on staff availability, which is somewhat reduced during Thursday teaching conferences and on evenings and weekends. Therefore, completion of postpartum permanent contraception procedures relies on appropriate management of patient expectations, consistent with a qualitative

Table 2
Factors associated with unfulfilled requests for postpartum permanent contraception following vaginal delivery

Variable	OR	p value[a]	aOR[b]	p value[c]
Age				
<30	1.00 (Referent)			
30–39	0.86 (0.47–1.57)	.63		
≥40	0.75 (0.23–2.42)	.63		
Marital status				
Married	1.00 (Referent)			
Not married	1.15 (0.78–1.72)	.48		
Insurance type				
Private	1.00 (Referent)			
Public insurance	0.62 (0.21–1.87)	.40		
BMI				
<35	1.00 (Referent)			
35–39.9	2.31 (1.09–4.89)	.03	1.92 (0.88–4.22)	.10
≥40	3.85 (1.55–9.57)	<.01	3.71 (1.46–9.48)	.01
Pregnancy risk status				
Low risk	1.00 (Referent)			
High risk	1.38 (0.65–2.91)	.40		
Parity				
≤2	1.00 (Referent)			
>2	1.52 (0.68–3.39)	.31		
Adequacy of prenatal care[d]				
Not adequate	1.00 (Referent)			
Adequate prenatal care	1.11 (0.52–2.29)	.79		
Delivery day of week				
Sunday–Tuesday	1.00 (Referent)			
Wednesday–Saturday	2.05 (1.13–3.69)	.02	2.02 (1.08–3.79)	.03
Gestational age at signing of federal sterilization consent				
<36 weeks	1.00 (Referent)			
≥36 weeks	5.10 (1.69–15.38)	<.01	5.10 (1.64–15.86)	.01

[a] For unadjusted OR.
[b] Adjusted for BMI, delivery day of week and gestational age at signing of federal sterilization consent.
[c] For adjusted OR.
[d] Defined by the Kotelchuck index, incorporating timing of onset and number of visits during prenatal care [19,20].

exploration by Gilliam et al. [13], as well as continued advocacy from providers, nursing and anesthesia to identify and seize windows of opportunity. Physicians must also preemptively assess the feasibility of minilaparotomy, as contraindications like morbid obesity and prior abdominal surgeries, which made up the majority of medical reasons for cancellation, are present prenatally. Finally, though lack of valid federal sterilization consent only affected 18% of our sample compared to 43% of patients in a study by Wolfe et al. [16], routine inquiry into postpartum contraceptive plans earlier in prenatal care could potentially minimize this further. Thorough prenatal counseling, both to identify inappropriate or ineligible surgical candidates and present alternate options, as well as to encourage all patients to consider a contraceptive back-up plan, could help ensure realistic patient expectations and improve contraceptive access.

The lack of follow-through with interval permanent contraception is consistent with previous studies finding continued barriers to accessing permanent contraception after postpartum discharge [17], with high subsequent pregnancy rates [12]. Nearly two thirds of patients in our sample chose a bridge method in anticipation of eventual permanent or long-acting contraception, with use of any bridge method associated with lower rates of pregnancy in the subsequent year. Our findings contrast with a study by Montague et al. [18], which found bridge method use to increase the odds of eventual LARC or permanent contraception but did not find an association with subsequent pregnancy; however, only one third of patients in that study opted to use bridge contraception. Many women in our study who were unable to access permanent contraception planned to use LARC, which was not routinely available in the immediate postpartum period at our institution but has become an increasingly common option for US women [25,26]. LARC has benefits similar to permanent contraception in terms of convenience and effectiveness [8,26,27], but further research is needed to understand whether women initiating LARC after denial of postpartum permanent contraception do so out of preference or acquiescence.

Table 3
Documented primary reason for nonfulfillment of requested postpartum permanent contraception after vaginal delivery

Primary reason	Total n=111 (%)
Invalid federal sterilization consent	20 (18.0%)
Lack of OR/anesthesia availability	14 (12.6%)
Maternal obesity	17 (15.3%)
Maternal medical problem	13 (11.7%)
Any changed mind	31 (27.9%)
Refusal to remain NPO	11 (9.9%)
Procedural concerns	10 (9.0%)
Ambivalence	5 (4.5%)
Other	2 (1.8%)
Unknown	14 (12.6%)
Unclear	16 (14.4%)

Our study was limited by its retrospective use of medical records, depending on the accuracy and thoroughness of charted documentation, with one third of reasons for procedure cancellation not fully elucidated. Our sampling strategy relied on the expectation that all patients with sincere interest in permanent contraception were encouraged to sign consent at some point during their peripartum care, as was the standard practice in our institution, and that such consents would be captured by our search terms. However, some women with unfulfilled requests, especially those with private insurance, may not have been captured. If true, our analysis would have overestimated fulfillment of permanent contraception requests. Reproductive care sought outside our institution could have resulted in underestimation of subsequent contraceptive and pregnancy outcomes, especially given that patients who did not follow up in our system were less likely to use bridge contraception. Since over 90% of patients seeking postpartum permanent contraception in our institution rely on public health insurance, our findings may not be generalizable to all populations. Our institutional scheduling policies may not be applicable to all sites; however, one survey found that 40% of institutions do not routinely use labor epidurals for

Table 4
Alternate contraceptive plans after unfulfilled request for postpartum permanent contraception

	Total n=111 (%)	Followed[a] n=82 (%)	Subsequent pregnancy[b] n=18 (%)
Alternate contraceptive plan			
Interval female permanent contraception	73 (65.8%)	57 (69.5%)	13 (72.2%)
Interval female permanent contraception or LARC	8 (7.2%)	5 (6.1%)	2 (11.1%)
LARC	18 (16.2%)	12 (14.6%)	2 (11.1%)
Short-acting contraception	9 (8.1%)	7 (8.5%)	1 (5.6%)
Vasectomy	1 (0.9%)	1 (1.2%)	0 (0%)
Nothing	2 (1.8%)	0 (0%)	0 (0%)
Bridge contraceptive method[c]			
DMPA	48 (49.5%)	41 (56.2%)	6 (35.3%)
Progestin-only pills	15 (15.5%)	12 (16.4%)	3 (17.7%)
None	34 (35.1%)	20 (27.4%)	8 (47.1%)

[a] Follow-up data for subsequent 12 months in health care system. Comparison of alternative contraceptive plans between patients who were followed and those who were not: p=.17. Comparison of bridge contraceptive methods between patients who were followed and those who were not: p=.02.
[b] Pregnancies in subsequent 12 months among patients followed in health care system. Comparison of alternative contraceptive plans between patients with subsequent pregnancies and those without: p=.79. Comparison of bridge contraceptive methods between patients with subsequent pregnancies and those without: p=.09.
[c] Denominators for bridge contraception based on those discharged with plan for interval permanent or long-acting reversible contraceptive: n=97 for total, n=73 for those followed in health care system, n=17 for those with subsequent pregnancies.

postpartum permanent contraceptive procedures [28]. These data may also not represent current convention in our institution, and comparisons to newer data may be useful to assess whether interval practice changes have affected fulfillment rates. Strengths of this study include the integration of the electronic record and tendency for detailed documentation, which allowed confirmation of contraceptive plans and reasons for cancellation, as well as short- and long-term alternative contraceptive plans. Finally, 74% of patients in our sample received follow-up care in our health system, allowing identification of subsequent events after the immediate postpartum period.

Nearly half of unfulfilled postpartum permanent contraception requests are cancelled because of logistical barriers, such as surgical scheduling policies and onerous consent waiting periods. Reproductive health advocates have called for changes to the federal sterilization consent policy to find new ways to protect autonomy without obstructing access to desired care [23,24]. Physicians and other members of the health care team, acknowledging that this procedure will always include some unpredictability and inconvenience, must prioritize patient needs and advocate for access to care. Burdensome scheduling practices that require prolonged fasting and additional anesthesia should be identified and addressed, for instance, by prioritizing scheduling for these time-sensitive procedures and utilizing existing epidural anesthesia [10,29]. Physicians must also adequately counsel and prepare patients prenatally about the circumstances and likelihood for procedure completion, helping them identify alternative contraceptive plans when appropriate. When interval permanent contraception is desired, access should be facilitated, for instance, by scheduling future procedures prior to hospital discharge, which has been found to significantly increase uptake of permanent contraception by 6 months postpartum compared to standard scheduling policies [30]. Finally, increasing access to immediate postpartum LARC will create more and safer options for highly effective and convenient postpartum contraception. By providing a wide range of options and minimizing barriers to access, health care providers can help women fulfill their reproductive choices.

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